



Pilot outcome results of culturally adapted evidence-based substance use disorder treatment with a Southwest Tribe



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ABSTRACT

Introduction: Although American Indians/Alaska Natives (AI/ANs) have exhibited high rates of alcohol and drug use disorders, there is a paucity of substance use disorder treatment outcome research. In addition, there exists controversy about whether evidence-based treatments (EBTs) are culturally appropriate given that they were derived mainly by and for non-Hispanic White populations and do not explicitly include aspects of AI/AN culture and worldview.

Methods: In this pilot study, we collaboratively culturally adapted two EBTs, Motivational Interviewing and Community Reinforcement Approach (MICRA), and evaluated substance use and psychological outcomes at 4- and 8-months post-baseline assessment. In preparation for a larger randomized clinical trial (RCT), eight tribal members (75% male) participated in this pilot treatment study. Measures included substance use, urine screens, self-efficacy, psychological distress, and hopelessness. All participants completed follow-up assessments at 4- and 8-months. Due to small sample size, effect sizes were calculated to evaluate outcomes pre- and post-treatment.

Results: Despite high rates of abstinence at baseline, percent days abstinent (PDA) increased at the 8-month time point for the most commonly used substances (alcohol, Hedges's $g = 0.59$, and marijuana, $g = 0.60$) and for all substances combined (excluding tobacco, $g = 0.56$). Improvements in psychological distress ($g = -0.66$) and 5 of the 7 Addiction Severity Index domains (range of $g = -0.42$ to -0.98) also emerged.

Conclusions: Results suggest that culturally adapted EBTs yield significant improvements in alcohol use, psychological distress, and legal problems among AI/ANs. Future research using RCT methodology is needed to examine efficacy and effectiveness.

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1. Introduction

American Indian/Alaska Native (AI/AN) individuals report high rates of past-month illicit drug use (12.3% vs. 9.5% non-Hispanic Whites; Substance Abuse and Mental Health Services Administration (SAMHSA), 2014) and past year substance use disorder (SUD; 14.9% of AI/ANs vs. 8.4% of non-Hispanic Whites; Substance Abuse and Mental Health Services Administration (SAMHSA), 2014). Furthermore, the rate of alcohol-induced deaths among AI/ANs is 5.2 times that of the general population (Indian Health Service (IHS), 2014), and AI/AN evidence the highest rates of drug-induced deaths of all racial/ethnic populations (Centers for Disease Control and Prevention (CDCP), 2013).

One way to address these health status disparities is to partner with AI/AN tribes to identify and make available efficacious SUD treatments. The current study presents prospective results from a small feasibility pilot trial ($n = 8$) of two evidence-based treatments (EBTs) with a rural Southwest AI tribe.

Applying EBTs with racial/ethnic minorities engenders controversy. A review of EBT outcome studies indicates an underrepresentation of racial/ethnic minority participants, leading several researchers to argue that EBTs do not have evidence of efficacy with racial/ethnic minority participants (e.g., Eap & Hall, 2007; Hall, 2001; Miranda et al., 2005; U.S. Department of Health and Human Services (DHHS), 2001). In considering treatment for AI/ANs, Calabrese (2008) argued against EBTs because they are secular and dyadic in nature, compared to AI/AN traditional healing that focuses on sacred aspects of well-being in the community, often with a collective worldview. Gone (2008) interviewed a Native American elder who believed that EBTs do not

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acknowledge or value indigenous ways of healing but rather “brain-wash me to be a Whiteman” (p. 381). Similarly, Moore, Aarons, Davis, and Novins (2015) found that treatment administrators and providers were concerned as to whether EBTs have cultural relevance. Yet, it would seem unjust to deny ethnic minority populations access to EBTs that have been shown to ameliorate SUDs in other racial/ethnic groups (Miller, Villanueva, Tonigan, & Cuzmar, 2007). Similar to mainstream non-Hispanic White populations (Moos & Moos, 2006; Witkiewitz, Dearing, & Maisto, 2014), there are likely many paths to resolving substance use problems among AI/ANs, and one such way is through EBTs.

Dissemination of EBTs from research to practice has been slow (McLellan, 2006). In a survey of privately funded SUD treatment agencies ($n = 67$ rural programs; $n = 238$ urban), the percentage of programs that reported EBT adoption ranged from 36%–55% (Knudsen, Johnson, Roman, & Oser, 2003). Many barriers to dissemination have been documented: lack of clinician knowledge and skills for implementation, cost of training, distrust of research, and different values between researchers and clinicians (Addis & Krasnow, 2000; Garner, 2009; Miller, Sorensen, Selzer, & Brigham, 2006; Moore et al., 2015). Despite SUD program reports of using EBTs, researchers have found little correlation between counselor self-report and independent observer report of EBT fidelity (Levin, Owen, Stinchfield, Rabinowitz, & Pace, 1999; Miller & Mount, 2001). There is a clear need for effectiveness trials in community settings to decrease the research-to-practice gap; this study is a first step in implementing evidence-based, behavioral SUD treatments with AI/ANs in a community setting.

To date, only two randomized controlled SUD treatment studies employing EBTs with AI/ANs have been published (Greenfield & Venner, 2012). One study was a randomized controlled trial (RCT) comparing a manualized job skills-based intervention delivered in the participants' Native language to a 40-minute informational video ($N = 120$; Foley et al., 2010). At 3 month follow-up, there were no between group differences for employment or substance use outcomes. However, there were small improvements in job outcomes and significant improvements in substance use in both groups. The other published study was a pharmacological RCT with 101 rural Alaskans ($n = 68$ Alaska Natives [AN]; O'Malley et al., 2008). Participants were randomized to one of three arms: 1) placebo, 2) naltrexone plus placebo, and 3) naltrexone plus sertraline, and were followed for up to 68 weeks. Those in the naltrexone only and in the naltrexone plus sertraline group evidenced significantly higher rates of total abstinence and percent days abstinent (PDA) than did those in the placebo group. These patterns of findings were similar in the AN only analyses but did not reach statistical significance. In sum, two AI/AN communities were receptive to EBTs and participants evidenced improved substance use outcomes, though no differential improvement between non-behavioral treatment (pharmacological or employment) and control conditions was found.

Cognitive behavioral therapy (CBT) is one EBT that has demonstrated positive outcomes for some ethnic minority populations for several diagnoses (Voss Horrell, 2008). For example, culturally adapted CBT for depression in a primary care setting resulted in good outcomes for a sample comprised of a majority of racial/ethnic minorities, both for prevention and treatment (Muñoz & Mendelson, 2005). Another research team focused on low-income, ethnic minority women with mild to moderate depression and found better outcomes for CBT than treatment as usual (TAU) when outreach efforts, childcare, and transportation were provided (Miranda et al., 2003). One review of two clinical trials did not find ethnic differences in substance use outcomes for CBT substance use disorder treatment between African American and non-Hispanic White populations (Milligan, Nich, & Carroll, 2004), but there is little research with Asian populations and no RCTs of CBT with AI/ANs. The only published effort to test a CBT approach with AI/AN was an adaptation of the Community Reinforcement Approach (CRA; Meyers & Smith, 1995) used in an inpatient setting that incorporated other cultural healing approaches such as the Sweatlodge (Miller, Meyers, & Hiller-Sturmhöfel, 1999). They reported preliminary findings of improved substance use outcomes at 6 months,

including many participants with continuous abstinence and some who were drinking with few or no related problems. The flexibility of the CRA framework and its extensive menu of treatment options were found to be easily adaptable for use with AI/ANs.

Another EBT, motivational interviewing (MI), has yielded promising evidence suggesting that it may be appropriate for AI/ANs. A meta-analysis that collapsed across various behavioral health outcome measures (e.g., substance use, eating disorders, HIV risk reduction, and water purification) determined that the effect size for MI was twice as large for ethnic minority samples as it was for non-Hispanic White samples (Hettema, Steele, & Miller, 2005). There are also applicable data from Project MATCH, a large multi-site trial examining efficacy of Motivational Enhancement Therapy (MET), CBT, and Twelve Step Facilitation approach (Project MATCH Research Group, 1997). AIs who received MET, consisting of MI plus personalized feedback (Miller, Zweben, DiClemente & Rychtarik, 1995b), had lower drinking intensity at follow-up than AI/ANs in the Twelve-Step Facilitation approach or CBT (Villanueva, Tonigan, & Miller, 2007). MET has also been employed as part of an enhanced case management prevention approach for Plains AI women of child-bearing age (May et al., 2008). For those who were drinking, 6-month follow-ups revealed significant decreases in the number of heavy drinking days, albeit it was no longer significant at the 12-month follow-up. A feasibility study of brief MI in an urban, Aboriginal primary care setting reported MI to be culturally appropriate (Brady, Sibthorpe, Bailie, Ball, & Sumnerdodd, 2002). Positive outcomes evidenced in these studies indicate the acceptability of MI for at least some AI/AN clients.

In the present study, our reservation-based tribal partner requested that MI and CRA be adapted to be more culturally congruent and acceptable. While the scientific process would encourage testing the original EBT with fidelity, Burlew, Copeland, Ahuama-Jonas, and Calsyn (2013) cite several reasons to consider adapting EBTs when transporting an EBT to a new population. Four of the six reasons apply to our tribal partner: (1) an unadapted EBT would be unacceptable; (2) an adaptation would increase attractiveness, engagement, retention, and outcomes; (3) cultural traditions influence behavior; and (4) it is more respectful to the group's knowledge and worldview. From an ecological system perspective (Bronfenbrenner, 1979), behavioral health problems such as SUDs are understood as arising not only from individual factors (psychosocial), but also from social factors (e.g., poverty, discrimination, & historical trauma) and institutional factors (e.g., inherent oppression, lack of equal access to resources and power). Experts in cultural adaptations recommend changes to reflect cultural worldviews and values, social determinants of health, language and idioms, communication style adaptations, and spirituality and traditional practices (e.g., Calabria, Clifford, Shakeshaft, & Doran, 2012; Hall, 2001).

The present study is a small pilot trial of MI and CRA (MICRA) adapted by a team of university and reservation-based partners for treatment seeking participants residing in a rural Southwest reservation. This feasibility trial was the first phase of a larger, on-going RCT comparing adapted MICRA to standard outpatient treatment at the tribal recovery center. The goal was to pilot recruitment and assessment procedures while testing the adapted MICRA intervention with 8 participants. During this process, treatment counselors worked to gain competency in MI and certification in CRA independently, as rated by MI and CRA experts. The research assistant achieved certification on substance use outcome measures. Here we examine the baseline characteristics of this sample and report on the outcomes of adapted MICRA at 4- and 8-month follow-ups.

2. Material and methods

2.1. Sample

Inclusion criteria included a DSM-IV-TR (American Psychiatric Association, 2000) SUD diagnosis, tribal enrollment, active seeking of SUD treatment, and the ability to participate in English (although all

study staff and counselors were bilingual in English and their Native language). Exclusion criteria were active psychosis, an opioid use disorder, major cognitive impairment, need for more intensive SUD treatment, and presence of imminent danger to self or others. No interested individuals were excluded for these reasons.

Participants were recruited from the reservation-based SUD recovery center between June 2010 and February 2011. During this time, 106 individuals entered the treatment center and 65 of these individuals (61.3%) were approached about study participation. Forty-one individuals (38.7%) were not approached about participation because they already had treatment plans in place ($n = 11$), entered treatment when study recruitment staff were not working ($n = 9$), needed medical detoxification ($n = 8$), did not belong to the tribe ($n = 6$), were not fluent in English ($n = 3$), or for miscellaneous other reasons ($n = 4$).

Of the 65 individuals approached for study participation, 13 (20%) were interested in learning more about the study and were referred to the MICRA offices for screening and consent. Fifty-two individuals (80%) of the 65 approached individuals were not interested in participating because they preferred treatment at the tribal treatment center ($n = 30$), did not want to participate in research ($n = 13$), were uncomfortable with randomization ($n = 4$), felt that the MICRA offices were too far away ($n = 2$), or wanted to attend residential treatment ($n = 2$).

The final treatment sample included eight individuals (69.2%) out of the 13 who were interested in the study. The five individuals who expressed interest in the study but did not begin treatment could not be reached to schedule a screening ($n = 3$), were screened but could not be reached for the baseline interview ($n = 1$), or completed the baseline interview but needed a higher level of care and were withdrawn from the study ($n = 1$).

2.2. Procedure

Potential participants had a single point of entry at the reservation's SUD treatment center where a staff member introduced the study to individuals initially presenting for treatment. She sent the names of interested individuals to the MICRA research assistant. The research assistant scheduled participant baseline assessments, screened for inclusion and exclusion criteria, and conducted informed consent procedures. Baseline assessment interviews were completed in three to five hours with \$50 gift cards as compensation. Upon completion, the participant was assigned to a counselor for 16–20 MICRA sessions. Follow-up interviews were conducted at four and eight months following baseline assessment. Compensation of \$50 was provided to participants for each interview. Both the university internal review board and the Tribal Council approved all study related procedures and activities, amendments, and the Tribal Council approved this publication.

2.3. Measures

2.3.1. Abbreviated Form-90-DI

The drug use pattern chart and time-line follow-back portion of the Form-90-DI (Westerberg, Tonigan, & Miller, 1998) were administered at baseline and each follow-up interview to determine with the participant the quantity and frequency of alcohol, drug and tobacco use. The clients' raw data were used to create the variables *percent days abstinent* (PDA) from alcohol, as well as PDA from marijuana and PDA from all drugs excluding tobacco. The Form-90 demonstrates acceptable levels of reliability for the collection of alcohol and drug use data when administered by properly trained interviewers (Tonigan, Miller, & Brown, 1997).

2.3.2. Addiction Severity Index

Extent of client impairment in various areas of functioning was determined using a culturally adapted version of the Addiction Severity Index (ASI-NA; Carise & McLellan, 1999; Chong & Lopez, 2005). The ASI assesses seven potential problem areas including medical, employment,

drug, alcohol, legal, family/social, and psychological. The intake version of the ASI required participants to provide both lifetime and past-30 day information. The ASI has demonstrated sound psychometric properties and is included in nearly all clinical trials in the addiction field (McLellan, Cacciola, Alterman, Rikoon, & Carise, 2006). Possible scores for each area range from 0 (no problem) to 1 (severe problem).

2.3.3. Brief Symptom Inventory-18

The Brief Symptom Inventory-18 (BSI-18; Derogatis, 2000) consists of 18 self-report items that assess psychological distress across three domain subscales, including *Somatization*, *Depression*, and *Anxiety*. Participants were asked to report how much they were currently distressed by each symptom on a 5-point Likert scale, with zero indicative of "not at all" and four indicative of "extremely". T-score values were generated for an overall *Global Severity Index* (GSI) that encompassed all items, ranging from zero to 72. Derogatis (2000) found acceptable levels of internal consistency for the *Global Severity Index* (Cronbach's $\alpha = .90$). Internal consistency for the BSI was $\alpha = .86$ in our sample.

2.3.4. Structured clinical interview for the DSM-IV

The substance use disorder sections of the *Structured Clinical Interview for the*

Diagnostic and Statistical Manual of Mental Disorders IV (SCID; Spitzer, Gibbon, & Williams, 1998) were used to screen for the presence of current and lifetime alcohol and drug abuse and dependence diagnoses.

2.3.5. Beck Hopelessness Scale

The Beck Hopelessness Scale (BHS; Beck, Weissman, Lester, & Trexler, 1974) is a 20-item, self-report scale that indicated the extent to which participants felt pessimistic about the future by selecting "true" or "false" for each question. Possible BHS scale scores range from 0 to 20. The BHS has been shown to be a valid predictor of suicide in a psychiatric outpatient sample (Beck et al., 1989). Reliability was low in our sample ($\alpha = .43$).

2.3.6. Alcohol and Drug Use Self-Efficacy Scale

The Alcohol and Drug Use Self-Efficacy Scale (ADUSES; Brown, Seraganian, Tremblay, & Annis, 2002) includes 20 items rated from 0 (not at all) to 4 (extremely) tapping confidence to not use drugs or alcohol in different situations. The average of the 20 items provided a measure of overall abstinence self-efficacy (range 0–4). The ADUSE was adapted from the alcohol-specific Alcohol Abstinence Self-Efficacy Scale (DiClemente, Carbonari, Montgomery, & Hughes, 1994), which has demonstrated good reliability.

2.4. Intervention

The intervention included between 16 and 20 individual counseling sessions, depending on client need and choice, and contained elements of both MI and CRA. The intervention was manual-guided, and yet it was still individualized to each client with the clinician using clinical judgment to time the introduction of various procedures. Experts in MI and CRA provided the counselor trainings, telephone coaching and feedback on taped sessions, and determined counselor competence in MI and CRA.

2.4.1. Motivational interviewing

Motivational interviewing (MI) is a directive approach based on client-centered counseling methods used to increase client behavior change by resolving ambivalence (Miller & Rollnick, 2012). MI uses evocation to understand the client's perspective, motivation, and solutions. In the current study, MI was meant to be a precursor to the CRA treatment, as well as a general style of communicating throughout the CRA component. Cultural adaptations based on previous work (Venner, Feldstein, & Tafoya, 2007) included: (1) culturally consistent greetings

and introductions that involved the spiritual aspect of social interactions and a discussion of how the counselor and client may be related by clan, (2) a reliance on spirituality (as appropriate) and extended family and clan relations as part of enhancing motivation to make changes in substance use behaviors, and (3) use of two AI counselors who were both fluent in their native language, and thus could weave their language into most sessions with clients who were also fluent.

2.4.2. Community Reinforcement Approach (CRA)

The CRA (Meyers & Smith, 1995) portion of treatment consisted of a menu of procedures that the counselors and clients chose from in order to meet the client's needs. CRA employs principles of operant conditioning to increase sources of positive reinforcement for non-substance using activities, and to engage the client in positive pro-social activities that replace substance use. A primary goal for this study was to re-engage clients in culturally relevant activities and relationships such as with extended family, clan, community, and (if applicable) spiritual and societal activities and responsibilities. Additional cultural adaptations included changing the forms to include more visual cues and lay language to make the concepts more accessible.

2.5. Data analysis

Due to the small number of participants included in this pilot study and the need to correct for small sample size bias, Hedges's *g* effect size calculations were used rather than paired-sample *t*-tests to examine participant change on relevant outcome variables from baseline to 8 months. In addition, we calculated confidence intervals and conducted significance testing of the effect sizes (Lakens, 2013).

3. Results

3.1. Participants

All participants ($n = 8$) were members of one Southwestern tribe and lived on the reservation or in neighboring communities. Seventy-five percent were male ($n = 6$) and the average age was 42.5 years ($SD = 13.17$; range 21 to 58 years). The average educational attainment was 11.5 years ($SD = 1.41$). When asked about religious preferences, all but one participant reported a preference for tribal specific spiritual practices over other forms of spirituality and religion.

3.2. Substance use

Participants used alcohol and marijuana most commonly with all but one participant endorsing past 30-day alcohol use and all but two

endorsing past 30-day marijuana use. All participants met criteria for a current SUD. At baseline, participants endorsed using alcohol on 6.5 out of the past 30 days ($SD = 5.21$), drinking to intoxication on 3.5 out of the past 30 days ($SD = 3.74$), and smoking marijuana on 4.13 out of the past 30 days ($SD = 3.64$). Only one participant reported past-30 day cocaine use at baseline, so analyses of cocaine outcomes were omitted.

Table 1 presents the baseline (pre) and 8-month (post) means, standard deviations, Hedges's *g*, upper and lower limits of the confidence intervals, *z*, and *p* values for each of the outcome variables. From baseline to 4-months, the changes in PDA were minimal [PDA alcohol $M = 83.83$ ($SD = 13.89$); PDA marijuana $M = 88.88$ ($SD = 13.32$); PDA all substances excluding tobacco $M = 74.72$ ($SD = 15.59$)]. Percent days abstinent from all substances excluding tobacco increased numerically by the 8-month follow-up. Compared to baseline, there was a significant increase in PDA from alcohol ($g = 0.59$). While changes from baseline to 8-month yielded similar effect sizes for PDA from marijuana ($g = 0.60$) and for all substances excluding tobacco ($g = 0.56$), they were nonsignificant in this small sample. Results from an oral drug screen corroborated these findings. At intake and at the 4-month follow-up, two participants screened positive for marijuana use; at the 8-month follow-up only one participant screened positive for marijuana use. All other drug screens (i.e., opiates, cocaine, amphetamines, benzodiazepines, MDMA) were negative throughout the study.

3.3. Addiction Severity Index

From intake to the 8-month follow-up, reductions were observed in ASI problem severity composite scores in 5 out of 7 total problem areas, including legal, drug, alcohol, medical, and psychiatric severity (in descending order by effect size). Legal composite severity score reductions were significant ($g = -0.98$). Composite scores for the alcohol and drug problem areas decreased and approached significance in this small sample. The medical and psychiatric composite severity scores decreased but were not significant. In contrast to reductions in other ASI severity scores, employment composite severity scores increased slightly while family composite severity scores appeared unchanged from baseline to 8 months.

3.4. Psychological distress

Reductions in BSI GSI from baseline to 8-month follow-up were significant ($g = -0.66$; see Table 1). Improvements in the average score on the BHS were smaller ($g = -0.33$) and nonsignificant.

Table 1
Hedges's *g* effect sizes for outcomes measured at baseline and 8-month follow-up.

Variable	Pre <i>M</i> (<i>SD</i>)	Post <i>M</i> (<i>SD</i>)	Hedges's <i>g</i> (<i>LL/UL</i>)	<i>z</i>	<i>p</i>
PDA alcohol	80.73 (13.95)	89.57 (12.00)	0.59 (0.20/0.97)	2.99	0.003
PDA marijuana	88.99 (9.71)	94.40 (5.83)	0.60 (-0.29/1.47)	1.32	0.186
PDA all except tobacco	69.61 (14.05)	80.34 (19.26)	0.56 (-0.18/1.30)	1.48	0.139
ASI					
ASI legal	0.28 (0.21)	0.08 (0.12)	-0.98 (-1.89/-0.06)	-2.08	0.037
ASI drug	0.06 (0.06)	0.02 (0.02)	-0.72 (0.38/0.14)	-1.90	0.057
ASI alcohol	0.28 (0.20)	0.15 (0.19)	.57 (0.29/0.09)	-1.95	0.051
ASI medical	0.28 (0.32)	0.13 (0.13)	-0.57 (-1.83/0.69)	-0.88	0.379
ASI psych	0.13 (0.21)	0.05 (0.12)	-0.42 (-1.24/0.41)	-0.99	0.323
ASI employ	0.83 (0.18)	0.85 (0.22)	-0.11 (-0.43/0.21)	-0.66	0.508
ASI family	0.10 (0.10)	0.11 (0.12)	-0.04 (-0.47/0.38)	-0.19	0.847
BSI	52.38 (10.64)	45.00 (8.93)	-0.66 (-1.30/-0.02)	-2.03	0.043
BHS	3.88 (2.59)	2.88 (2.75)	-0.33 (-0.96/0.29)	-1.04	0.30
ADUSES	2.66 (0.82)	2.84 (1.00)	0.17 (0.57/0.23)	0.83	0.40

Note: LL = lower limit confidence interval; UL = upper limit confidence interval; PDA = percent days abstinent; Psych = psychiatric; employ = employment; BSI = Brief Symptom Inventory; BHS = Beck Hopelessness Scale; ADUSES = Alcohol and Drug Use Self-Efficacy Scale.

3.5. Self-efficacy

Surprisingly, ADUSES scores only increased slightly from intake to the 8-month follow-up ($g = 0.17$). On average at each assessment participants felt between “not very” and “moderately” confident that they could avoid alcohol and drug use.

4. Discussion

In the present pilot study, we examined outcomes of culturally adapted MI and CRA (MICRA) with AI men and women meeting criteria for a SUD, seeking treatment, and living on or near a Southwestern reservation. The findings suggest that this culturally adapted MICRA intervention may be effective at reducing substance use and improving psychological functioning among rural AI/ANs seeking treatment. The significant increases in PDA from alcohol and decreases in psychological distress are especially striking in light of the small sample size. PDA from marijuana and from all substances (excluding tobacco) increased between baseline and 8-month follow-up but did not reach statistical significance. In addition, 5 of the 7 life domains (2 of which were substance related) measured with the Addiction Severity Index showed medium to large effect sizes for decreases in problem severity with the legal composite score reaching significance and the alcohol and drug domains approaching significance. These results are in line with previous preliminary findings of CRA with AI/ANs (Miller et al., 1999). Similarly, a secondary analysis found AI/ANs evidenced better substance use outcomes in an MI condition compared to TSF and CBT (Villanueva et al., 2007). Using culturally adapted MICRA, our outcomes are consistent with previous positive findings using unadapted MI and CRA with AI/ANs. Further replication of culturally adapted MICRA outcomes with AI/ANs is warranted.

Despite fairly high rates of abstinent days at intake, participants reduced their substance use through the 8-month follow-up. Rates of abstinence from alcohol significantly increased. Abstinence from marijuana and from all substances (excluding tobacco) increased from baseline to 8-month follow-up (89–94% and 70–80% respectively). It is unclear why abstinence rates were so high at baseline as days incarcerated in the past 90 averaged 5.4%. It may be that participants had already begun changing prior to entering treatment, as found by other researchers (Penberthy et al., 2007). In addition, the alcohol and drug ASI subscales improved and approached significance. Similar reductions in alcohol and drug ASI severity scores were observed across nine months in another treatment-attending AI sample (Evans, Spear, Huang, & Hser, 2006). Only the family and employment ASI subscales were not improved at follow-up time points. While significant others were invited to sessions, very few attended, thus limiting the impact of treatment on family functioning. Similar to a previous study with a nearby Southwestern tribe (Foley et al., 2010), employment is difficult to impact in an area with a relative lack of job opportunities and high rates of unemployment.

In light of the significant changes in PDA alcohol and moderate effect sizes for marijuana and for all substances except tobacco, we were surprised that self-efficacy only changed from low to moderate, representing a small effect size. A robust finding in the addiction treatment field is a significant increase in self-efficacy during treatment (McKellar, Ilgen, Moos, & Moos, 2008) and post treatment (Maisto, Connors, & Zywiak, 2000). Because past research reported that higher levels of education were associated with higher levels of abstinence self-efficacy (Ilgen, McKellar, & Moos, 2007), it is possible that lower levels of formal education in this sample contributed to lower levels of and changes in self-efficacy. Another factor found to impact level of self-efficacy is amount of exposure to other individuals using substances (Stephens, Wertz, & Roffman, 1995). Perhaps our participants were exposed to high numbers of people using substances (although we did not measure this) yielding only small increases in self-efficacy. Unfortunately, there are no reports in the literature about abstinence

self-efficacy among AI/ANs. Future research on the psychometric properties of the ADUSE among AI/ANs would strengthen interpretation of results.

In addition to reductions in substance use, participants also reported improvements in psychological functioning, medical health, and legal problems. Amelioration of psychological distress yielded significant improvements as measured by the BSI and a medium effect as measured by the ASI psychiatric subscale while decreases in hopelessness resulted in a small, nonsignificant effect. Reports of medical health improvements were medium in effect size. Finally, legal problems evidenced a large, significant effect size from baseline to 8-month follow-up. In line with AI/AN value of holistic healing along with CRA's focus on many life domains, it is important to measure substance use outcomes as well as other indicators of psychological, health, and overall functioning.

4.1. Cultural adaptations

The major significance of this preliminary evidence of positive response to culturally adapted MICRA among AI/ANs is twofold: one, a cultural adaptation of two EBTs for this tribe appears effective, and two, dissemination and implementation of EBTs for reservation-dwelling AI/ANs was only possible due to the cultural adaptations. The culturally adapted MICRA appears to be effective as was a previous implementation of MI and aspects of CRA in Project COMBINE with general U.S. samples (Anton et al., 2006). Results from the current study are further corroborated by a previous study of internet-based CRA delivered to urban AIs that found high rates of acceptability for CRA, though participants noted several suggestions to increase cultural relevance (Campbell et al., 2015). For AI/ANs who are facing substantial substance use related health disparities, cultural adaptations of EBTs represent an important avenue for reducing these health disparities.

The successful implementation of evidence-based treatment on a Southwest reservation indicates that some tribes will be open to adopting and adapting EBTs in partnership with academic researchers. It is noteworthy that both of the AI treatment counselors were eager to learn the MICRA treatment protocol, were fluent in their Native language, and adhered to traditional spiritual beliefs and practices. Thus, it is important not to assume that more traditional AI/ANs or tribes will oppose the use of EBTs when they have been culturally adapted. In addition, training of tribal members in EBTs will improve sustainability, build local research and evidence-based treatment capacity, and help reduce disproportionate alcohol-related health and social disparities. Given the vast heterogeneity among AI/ANs in terms of history, enculturation, language, and culture and customs, it is probable that a wide variety of SUD healing and treatment options and combinations are required. Similar to the larger non-Hispanic White population, AI/AN people who have resolved SUDs attribute their success to a number of different factors (Bezdek, Croy, Spicer, & the AI-SUPERPFP Team, 2004; Fletcher, 2002; Quintero, 2000; Valliant, 1995). Thus, one type of treatment or mutual help group or indigenous healing method is not likely to work for everyone. Our Southwest tribal partner in this pilot study was open and interested to using EBTs once they were culturally adapted, and the participants who were willing to enter this pilot study reported significant improvements in substance use outcomes as well as improvements in AI/AN spirituality (Greenfield et al., 2015). In this pilot study, we worked to preserve and appreciate tribal worldviews and spirituality while still introducing an EBT.

4.2. Strengths and limitations

The main strengths of this study include contributing to the sparse literature on addiction treatment research with AI/ANs, adapting two EBTs in partnership with the tribal council and tribally enrolled counselors, using MI and CRA experts for training and fidelity monitoring, and recruiting from a community treatment agency in a rural setting.

Despite these strengths, limitations include a small sample size and lack of a control group impacting generalizability and confidence that the outcomes are due to the MICRA intervention. In addition, the rates of people interested in participating in this study were low, so these results may not generalize to all tribal members. It is striking that several analyses reached statistical significance with such a small sample size. Analyses of RCT data comparing MICRA to treatment as usual are underway and will elucidate the efficacy of MICRA for rural AI/ANs.

4.3. Implications

While funding agencies mandate that evidence based treatments (EBTs) are implemented in SUD settings, there is likely a mixed reception of EBTs among tribes (Moore et al., 2015). Several authors have argued that current treatments with evidence of efficacy and effectiveness may not apply to ethnic minority groups such as AI/ANs (e.g., Hall, 2001; Miranda et al., 2005). However, our experience using aspects of the community-based participatory research approach indicate some tribes will embrace culturally adapted EBTs and the research necessary to test effectiveness and efficacy. Future research should examine efficacy and effectiveness of EBTs as well as that of traditional AI/AN modes of healing such as drumming (Dickerson, et al., 2014). Such studies would increase generalizability and evidence for effective SUD treatment, thereby addressing and reducing the substantial substance related health disparities AI/ANs experience.

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Contributors

Author A designed the study, wrote the first draft of the introduction and much of the discussion sections. Author B wrote the manual of operations, conducted the majority of analyses, and wrote the first draft of the results and started the discussion section. Author C conducted some analyses and wrote the first draft of the method section. Author D helped with data questions and some literature search. Authors E-G helped with interpretation of results. Author H contributed to scientific editing and writing. All Authors contributed to and have approved the final manuscript.

Conflict of Interest

Authors A and H have conflicts of interest that are managed by the University of New Mexico Conflict of Interest committee. Author A provides consultation for Motivational Interviewing trainings and Author H provides consultation for Community Reinforcement Approach trainings.

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